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What is a Central Venous Catheter?
A central venous catheter, also called a central line, is a small flexible tube inserted into a large vein in your chest. It is used to give you fluid, nutrients, medicine, and blood products. It is also used to get blood samples without having to draw blood from your arm. Many types of central venous catheters are available; they may be called tunneled catheters, central venous lines, and Hickman lines.

Central Venous Catheter Placement: What to Expect
Inserting the central line is a minor surgical procedure. It is done in a procedure suite or an operating room, and takes about one hour. Your doctor will decide whether to use local with or without sedation. The catheter is threaded through a “tunnel” under your skin, and then placed into a large vein in your chest near your neck that returns blood to your heart. A small cuff on the catheter helps hold it in place in the tunnel underneath your skin. This cuff also acts as a barrier to help prevent bacteria on your skin from traveling up the catheter tunnel and into your bloodstream. You will likely also have a few stitches placed to help secure the line. Your shoulder and chest area may be sore for a few days after insertion, for which a mild pain reliever will be prescribed. It helps to move your shoulder and neck right after surgery to help keep the area from getting stiff.

How is the procedure done?
- Your doctor will numb the chest and neck area with a local anesthetic.
- Your doctor will make two small incisions - one in the upper chest near the neck, and another on the lower chest.
- Between these incisions, your doctor will make a tunnel under your skin.
- The catheter will be inserted into the lower incision on your chest and pulled through the tunnel.
- The catheter will be inserted into a large chest vein located near your neck (this vein returns blood to the heart).

Things to remember:
- Securing the line by wearing a tight-fitting tank top or sports bra for at least one night after placement is recommended.
- Do not take aspirin, ibuprofen, or other over-the-counter pain medications without first checking with your nurse or doctor.
- Routine exercise, housework, sexual activity, sleep, and travel are not limited by having a central venous catheter, but before doing any heavy lifting or physical work, speak with your doctor or nurse.

Catheter Care at a Glance

<table>
<thead>
<tr>
<th>Dressing Type</th>
<th>Dressing Change</th>
<th>Flushing</th>
<th>Tape Tabs Change</th>
<th>Alcohol to Wipe Off Catheter Line</th>
<th>Parafilm®</th>
<th>AquaGuard®</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tegaderm® CHG</td>
<td>every 7 days</td>
<td>daily or with each use</td>
<td>daily</td>
<td>daily</td>
<td>with bathing</td>
<td>with bathing</td>
</tr>
<tr>
<td>Gauze and Tape</td>
<td>every 1-2 days</td>
<td>daily or with each use</td>
<td>daily</td>
<td>daily</td>
<td>with bathing</td>
<td>with bathing</td>
</tr>
</tbody>
</table>
## Fast Facts on Central Line Care: How to Protect Your Catheter

### DO

- Keep dressing supplies dry.
- Secure your catheter in one of three ways to prevent accidental removal of the line:
  - Place plastic tape tabs between clamp and cap on the catheter and change daily. Use the plastic tape tabs and bulldog clamp to secure the catheter to clothing or a necklace.
  - Place catheter in a clean cloth pouch and secure the pouch with a bulldog clamp to clothing or a necklace. Pouch should be washed regularly.
  - Coil the catheter over the exit site and tape it to the skin.
- Always place catheter clamps on the thick reinforced area of the line, not too close to the hard plastic portion of the line.
- Change the dressing if it is wet, if it starts to come off, or if there is moisture underneath it.
- Clean both sides of your line once a day with alcohol swabs and replace plastic tape tabs.
- When bathing or showering, always cover the exit site of your catheter with a plastic covering such as AquaGuard® or plastic wrap to prevent tap water from entering the catheter tunnel. The uncovered exit site should not come in contact with tap or bath water.
- Always securely wrap your Clave® end caps with Parafilm® to prevent water from entering the Clave® top or into the connection to the catheter.
- If you notice moisture under the dressing when removing the plastic covering and Parafilm®, change the dressing. If you notice moisture under the Parafilm®, ask to have your Clave® caps changed in the clinic.
- If you see build-up, you first cleanse skin around the exit site with a sterile saline-soaked gauze pad to remove ChloraPrep One Step® (chlorhexidine) and the no-sting barrier. Never use tap water to cleanse the exit site.
- **Keep your bulldog clamp with you at all times. The bulldog clamp is a safety clamp. If the catheter leaks, gets cut, or breaks, clamp the catheter close to your chest and call the clinic immediately.**

### DON’T

- Do not take the Clave® cap connectors off of your catheter.
- Do not tape over the connection between Clave® caps and catheter.
- Avoid swimming pools and hot tubs. If this is a problem for you, discuss with your nurse.
- Do not allow Clave® caps, central catheter or exit site to be submerged in bath water.
- Do not store catheter supplies in the bathroom or kitchen.
- **Do not use scissors near your catheter.**

### Daily Care: How to Flush

When to flush and what solution to use:

- Flush each line of the catheter with normal saline followed by heparin solution at least once each day and after each use.
- If you are having a blood draw, both lines of the catheter will be flushed at that time unless the side not used for blood draw is connected to IV tubing.
- Flush the catheter at the beginning of an infusion with normal saline only.
- Flush the catheter at the end of an infusion. Use normal saline followed by heparin solution.
Antibiotic Infusions

- **Transplant**: If you are receiving antibiotics, your doctor will recommend that you alternate infusing your antibiotic doses between lines of your catheter.
- **General Oncology**: If you are receiving antibiotics, check with your doctor or nurse to see if they recommend that you alternate between lines of your catheter when infusing your antibiotic doses.

Anti-Coagulation Therapy for Your Catheter

**Heparin** solution is used to flush your catheter to prevent a clot within the central line. Flush your catheter with normal saline and heparin solution at least once a day and after a blood draw, or at the end of an infusion. The daily heparin flush is still required even if you are on any of the oral or injectable blood thinners listed below to prevent or treat a blood clot.

In addition to heparin flushes, you may also need to take other medications to prevent clotting, such as:

- **Warfarin (Coumadin®)** is given orally to prevent or treat clotting within or around your central line or to treat blood clots that have formed in other blood vessels. You will have your Protime (PT) and International Normalized Ratio (INR) blood levels checked to make sure that you are treated appropriately.
- **Low-molecular weight heparin**, such as enoxaparin (Lovenox®), tinzaparin (Innohep®), and dalteparin (Fragmin®), or fondaparinux (Arixtra®; which is not a heparin or low-molecular weight heparin); one of these may be given to prevent or treat clot growth within or around your central line or to treat blood clots that have formed in other blood vessels. You will be prescribed only one of the low-molecular weight heparin medications or Arixtra® at any given time. You will receive a shot/injection under the skin 1-2 times each day. You will have heparin-activity levels checked to make sure that you are treated appropriately.

**Heparin allergy** or history of heparin-induced thrombocytopenia (HIT): If you have ever been told you have an allergy to heparin, do not use heparin or low-molecular weight heparin. This includes using heparin to flush your catheter. If you do have a heparin allergy, please ask about other flushing options. Discuss with your doctor or nurse if you are unsure if you have a heparin allergy.

**Flushing the Catheter**

Flush both sides of the line, first with saline, then with heparin solution.

1. Wash your hands.

2. Remove syringes from their packages by peeling the plastic downward.
3. Put on gloves. Vigorously scrub the Clave® cap with an alcohol wipe for 15 seconds using a twisting motion as if you were juicing an orange. Allow the Clave® to dry completely for at least 5 seconds.

![Image of a syringe being held and a cap being placed on it]

4. Hold the syringe with the cap on, pointed towards the ceiling, and remove the cap of the syringe. Carefully remove the air bubble by gently pulling down and then pushing up on the plunger. **Do not touch the end of the syringe because it is sterile. If you touch it, throw it out.**

![Image of a syringe with its cap off]

5. Be sure not to touch the end of the Clave® cap or end of the syringe with your hand. Insert the syringe into the center of the Clave® cap by pushing in and turning clockwise.

![Image of a syringe being inserted into a cap]

6. Unclamp the catheter.

![Image of a catheter being unclamped]

7. Push the plunger on the syringe with alternating pressure and release (starting and stopping to create turbulence) to inject the fluid into the catheter. This keeps the catheter clean. **Don’t empty the flush syringe. Always leave ½ ml of normal saline in the syringe as you clamp the line. End flushing with heparin using the second syringe. Leave 2 ml of heparin solution in the syringe as you clamp the line. Heparin prevents the line from clotting.**

![Image of a syringe being pushed down on a catheter]

8. Clamp catheter while keeping thumb on end of plunger of each syringe.

![Image of a catheter being clamped with a syringe being pushed down on it]

9. Remove the syringe. Hold the Clave® cap, not the catheter, when disconnecting from your line. **Throw both syringes away.** Discard in regular garbage can.

![Image of a syringe being removed and a catheter being disconnected]

10. Repeat steps 2-9 on the other line.
Daily Care: Cleaning the Catheter
1. If using tape tabs, remove plastic tape tabs near Clave® caps.
2. Use two alcohol wipes for each line, one to hold the line and one to wipe it. Start where line exits the dressing and wipe towards the end of the line. Take special care to thoroughly scrub around the connection between the line and the Clave® caps.
3. Replace plastic tape tabs near Clave® caps. Fold about ½ inch of tape over at each end to make the tab easier to remove. Remember to clean your catheter every day.

When to Change the Dressing
- **If you have a Tegaderm® CHG dressing:**
  - Dressing should be changed every 7 days.
  - Both dressing and exit site should be looked at each day.
  - Talk to your nurse if your skin is sensitive to the dressing.
  - The dressing should also be changed if:
    - The exit site cannot be seen because of drainage or moisture
    - The gel pad stays depressed when pressed with finger
    - The dressing starts to come off
- **If you have a gauze and tape dressing:**
  - Dressing should be changed every 24-48 hours.
  - Both dressing and exit site should be looked at each day.

Dressing Change Supplies
Wash your hands, and assemble supplies on a clean work surface.
- **If you have a Tegaderm® CHG dressing:**
  - 1 ChloraPrep One-Step® application, also called Chlorhexidine
  - 5 alcohol pads (2 pads for cleaning line, 3 pads for removing dressing)
  - 2 pairs clean gloves
  - 2 Cavilon No-Sting Barrier Film® foam pads
  - 1 transparent dressing (Tegaderm® CHG)
  - 10-ml syringe with saline
  - Sterile gauze pad
  - Plastic tape (if making tape tabs)
- **If you have a gauze and tape dressing:**
  - 2 packages 2x2 gauze or 2 packages 2x2 split gauze
  - 5 alcohol pads (2 pads for cleaning line, 3 pads for removing dressing)
  - Sterile saline syringe
  - Skin Prep
  - Paper tape
  - 1 ChloraPrep One-Step® application
  - 2 pairs of clean gloves
  - Plastic tape (for tape tabs)
Dressing Change Steps

1. Wash your hands with soap and water.

2. Put on clean gloves.

3. If present, remove plastic tape near Clave® caps.

4. Remove existing dressing.
   - **If you have a Tegaderm® CHG dressing:**
     Remove the old dressing by starting at bottom corner, lifting up and folding back upon itself, pulling “low and slow” or rolling with fingers. When gel pad is reached, use an alcohol pad or adhesive remover if needed to loosen gel pad from catheter and skin while continuing to slowly pull back on dressing, grasping both the gel pad and dressing. **Do not use scissors. Remove dressing and throw away.**
   - **If you have a gauze and tape dressing:**
     Remove the old gauze and tape dressing and throw away. **Do not use scissors.**

5. Report to your nurse if there is:
   - Bleeding or drainage at the catheter site.
   - Redness or swelling at the catheter site.
   - Pain or discomfort at the catheter site.

6. Remove gloves.

7. **Wash your hands again.**

8. Put on pair of clean gloves.

9. If crust is present, clean it from the catheter exit site using an alcohol wipe if necessary. If there is a scab, you do not need to remove it.

10. If build-up is noted or skin appears irritated, you may cleanse site first with sterile normal saline. Open gauze pad and wet the pad with saline from the syringe. Do not set a wet gauze pad on any surface or it will become dirty. Gently wipe skin in all directions around the exit site with the saline-soaked gauze. This will remove any buildup of ChloraPrep® and No-Sting Barrier® film and will also decrease skin irritation.

11. Scrub around the catheter exit site with ChloraPrep-One Step® swab using a back-and-forth motion across the exit site for 30 seconds. Allow to dry completely for 1-2 minutes.

   **The Chlorhexidine used while cleaning the catheter exit site (in the ChloraPrep One-Step® Swab) should be completely dry before applying the Cavilon No-Sting Barrier Film®.**
   - Alternate cleaning procedure for chlorhexidine allergy: Use a povidone-iodine swab to clean exit site in a circular motion, starting at the catheter circle and moving outward away from the exit site. Repeat with the other two povidone swabs, for a total of 3 cleanings at the exit site. Allow to air dry and do not wipe off, unless you are sensitive to povidone-iodine. If so, once dry, you may remove the iodine with a sterile gauze pad soaked with sterile normal saline from a syringe.
   - Alternate cleaning procedure for chlorhexidine AND povidone-iodine allergies: Use a 70% alcohol swab to clean the exit site in circular motion starting at the catheter circle and moving outward away from the exit site. Follow with the remaining 2 alcohol swab sticks. Allow to air dry.
12. Using two alcohol wipes for each line—one to hold the line and one to wipe it—start at your skin and wipe towards the end of the line. Take special care to thoroughly scrub around the connection between the line and the Clave® caps.

13. Apply skin prep.
   - **If you have a Tegaderm® CHG dressing:**
     Apply skin prep (Cavilon No-Sting Barrier Film®) to the area that will be under the transparent dressing. Avoid the exit site and the area that will be under the chlorhexidine gel pad, as it will not be able to penetrate the skin and work against infection. **Allow to dry completely for 1-2 minutes.**
   - **If you have a gauze and tape dressing:**
     Apply skin prep – allow to dry completely.

   - **If using a Tegaderm® CHG dressing:**
     o Apply Tegaderm® CHG transparent dressing by peeling the liner from the dressing, exposing the adhesive surface.
     o Center the dressing and gel pad over the catheter exit site and press gently to make it adhere. Make sure the catheter comes out of the dressing edge at a notch.
     o Slowly remove the paper frame from the dressing while smoothing down the dressing edge.
     o Smooth the entire dressing from the center towards the edge using firm pressure to enhance adhesion. If your gloves stick to the dressing you may remove them.
     o Remove tape “wings” from frame, lift catheter, and apply wing across opening of dressing underneath the catheter, creating a little hole where the catheter comes through. This helps keep the catheter secure.
     o Paint border (outside edges) of transparent dressing with Cavilon No-Sting Barrier Film® to create a seal between the transparent dressing and the skin.
   - **If you use a gauze and tape dressing:**
     o **If using folded gauze:** Touching only the corner, remove one of the 2x2 gauze pieces, fold in half and place under the catheter.
     o **If using split gauze:** Touching only the corners, place the 2 split gauze with the slits positioned horizontally (in opposite directions) around the central line as close as possible to where it exits the skin.
     o Place the second 2x2 over the line and gauze.
     o Secure gauze to skin with paper tape.

15. Secure the catheter by:
   - Coiling it over the exit site and taping it to the skin,
   - Placing in a clean cloth pouch and secure with a bulldog clamp.
   - Using a bulldog clamp to attach the tape tab to your clothing or necklace.

16. Write the date and time on the dressing.
Talk to your nurse if your skin is sensitive or irritated. An alternative dressing may be suggested.

Protecting Your Central Line When Bathing Or Showering

1. Wash your hands.

2. Place Parafilm® on Clave® caps and tubing connections.
   - First stretch the Parafilm®.
   - Then wrap it around the Clave® cap connection on each side of the catheter (stretching it makes it stick to itself).
   - Then flip it over the end of the catheter to cover the Clave® cap, using your fingers to twist and mold it around the catheter, with a spiraling-down technique.
   - Wrap only around the thicker part of the end of the catheter. The Parafilm® will fit closely around the connector and will stick to itself. Make a tab on the end so it will be easier to remove.

3. Cover the entire dressing with a square of AquaGuard® (approximately 9x9). You may reinforce the edges if you find it does not stay secure. The catheter tips may remain out. Remember to support your line with pouch, or tape and lanyard to avoid dislodging the line. Catheter tips must still be covered with Parafilm®. Alternatively, plastic wrap may also be used in place of AquaGuard®.

4. If you take a bath, the catheter should be kept above the water level at all times. If you shower, the dressing should be kept out of the direct stream of water.

5. After bathing, dry the plastic wrap or AquaGuard® with a towel, then remove and throw it away.

6. Remove Parafilm® from Clave® caps – DO NOT USE SCISSORS.

7. Replace the dressing if there is moisture underneath or it has become loose.

8. Secure the catheter by:
   - Coiling it over the exit site and taping it to the skin.
   - Placing in a clean cloth pouch and secure with a bulldog clamp.
   - Using a bulldog clamp to attach the tape tab to your necklace or clothing.

9. Clean both sides of your line once a day with alcohol swabs and replace plastic tape tabs if used.
## Troubleshooting Problems for the Central Venous Catheter

<table>
<thead>
<tr>
<th>Problem</th>
<th>Solution</th>
</tr>
</thead>
</table>
| **Line does not flush.** | 1. Check to see if catheter is clamped or kinked.  
2. Contact the SCCA Clinic or After Hours Clinic for instructions. |
| **Fluid is leaking from the catheter.** Catheter may be cut accidentally if dressing is removed with scissors. | 1. Immediately place a bulldog clamp on the catheter as close to the chest as possible.  
2. Check the catheter to find the break. It can be as small as a pinhole.  
3. Clean the break with an alcohol wipe.  
4. Wrap a sterile 2x2 gauze or an alcohol wipe around the break in the catheter and tape it in place.  
5. Notify the SCCA Clinic or After Hours Clinic immediately to get instructions. |
| **Clave® cap comes off catheter.** | 1. Immediately clamp catheter – **DO NOT REPLACE CAP.**  
2. Scrub catheter end with alcohol for 15 seconds and let dry 5 seconds.  
3. Place sterile saline syringe on end of catheter – **DO NOT FLUSH.**  
4. Notify the SCCA Clinic or the After Hours Clinic immediately to get further instructions. |
| **Swelling around the exit site or fluid leaking from exit site.** Swelling of the exit site, or bloody drainage or fluid leaking from the exit site can be a sign that the catheter is out of place. | 1. Stop any fluids running into the catheter.  
2. Place an ice pack on the swollen area; do not apply directly to bare skin.  
3. Notify the SCCA Clinic or the After Hours Clinic immediately to get instructions. |
| **Swelling of the neck and face.** Swelling of the neck and face can be a symptom of the catheter being out of place or that the vein is obstructed. | 1. Stop any fluids running into the catheter.  
2. Notify the SCCA Clinic or the After Hours Clinic immediately to get instructions. |
| **Air in the catheter, you ARE NOT short of breath.** This could be caused by air being accidentally injected into the catheter or the Clave® cap falling off when the line is not clamped. | 1. Check the clamp to make sure that it is closed and then wash hands.  
2. Open two pre-filled saline syringes and one pre-filled heparin solution flush syringe.  
3. Scrub the end of the catheter cap with alcohol for 15 seconds and let dry 5 seconds.  
4. Attach one of the pre-filled saline syringes.  
5. Unclamp the line.  
6. **Pull back** on the syringe until blood appears.  
7. Clamp the line and discard the syringe.  
8. Scrub the end of the catheter cap with alcohol for 15 seconds and let dry for 5 seconds.  
9. Flush the catheter as usual, making sure to close the clamp at the end of the flush.  
10. If you become short of breath, call 911. Call Clinic if Clave® cap is off. |
| **Air in the catheter and you SUDDENLY become SHORT OF BREATH, DIZZY, OR CONFUSED.** | 1. Lie down on your left side so that your right hip is lifted above the level of the heart while checking the clamps on the catheter to be sure they are closed.  
2. Call 911 for emergency assistance.  
3. Tell the medics to take you to UWMC’s emergency room (or Seattle Children’s if pediatrics). |